DATA SHARING NETWORKS FOR MUNICIPAL GOVERNMENTS IN BULGARIA

May 1995

Prepared for

U.S. Agency for International Development
Office of Environment and Urban Programs

Prepared by

James Brooks and William Donovan

National League of Cities Institute

INTERNATIONAL CITY/COUNTY MANAGEMENT ASSOCIATION
Local Government and Housing Privatization
USAID Contract No. EUR-0034-C-00-2034-00
Request for Services #119
USAID Project No. 180-0034

TABLE OF CONTENTS

Data Sharing Networks for Municipal Governments in Bulgaria

1 BACKGROUND

At the request of USAID and the International City/County Management Association (ICMA), the National League of Cities (NLC) conducted preliminary research on the feasibility of establishing an electronic data sharing network in Bulgaria. Such a network will facilitate information exchange among municipal leaders, and between these leaders and USAID representatives and contractors. The computer network USAID envisions should meet the following criteria:

1. High availability
2. Low cost per unit
3. Ease of use by persons without extensive computer skills
4. Software that is localized
5. Low usage cost to participating sites
6. Potential for future Internet access
7. System that is easily maintained

Local jurisdictions in Bulgaria are facing many of the same problems, and they operate with similar constraints. The elected leadership wants and needs to share details about initiatives on public policy topics of mutual concern—such as privatization, land mapping, housing or municipal finance. Learning from the experience of others saves time and resources and helps prevent duplication of costly mistakes.

While local governments in Bulgaria need to communicate with each other, they also need to secure information from non-municipal sources such as the Bulgarian Statistics Institute and USAID. Presently, this kind of data is being shared with assistance from the staff of joint contractors operating out of MTK Konsult in Sofia. However, the demand for data sharing is constrained by the limited ability to effectively transmit data via electronic means. Transmission by fax, for example, is inefficient and prone to delays and errors because of the low capacity of the telecommunications infrastructure.

2 SERVICE PROVIDERS IN BULGARIA

The staff at MTK Konsult has access to an electronic mail service provider. Their present provider is a company called Communication & Information Technologies (CITnet) operated out of Sofia by Mr. Veni Markovski. According to Mike Hoffman, the CITnet e-mail provider is the fourth company to be used by the MTK office. Most staff seemed pleased with the usefulness of the system. However, it was observed that it took over 15 minutes to send one message and receive two messages at 10:00 a.m. due to congestion on the trunk lines or at

the reception point. Later that day (6:30 p.m.) the project team was able to secure a connection to CITnet within 5 minutes with the assistance of the CITnet owner. A test e-mail message was successfully sent to the Massachusetts Municipal Association in Boston.

Two of the previous providers included another Bulgarian company, Digital Systems (operated out of Varna by Daniel Kalchev), and Sprint. In both cases, the technical support offered by these two providers was considered less than adequate. Mr. Kalchev is the original and current e-mail provider to the U.S. Peace Corps network. According to Alice Bunker, a Peace Corps business advisor based in Blagoevgrad, the e-mail system does work but it is generally slow and difficult to access using the dial-up telephone lines. She is not aware of any plans to change service providers.

In discussions about e-mail links for local governments in Bulgaria, USAID representative Brad Fujimoto concurred with the assessment that the Bulgarian entrepreneurs such as Mr. Kalchev and Mr. Markovski may be reaching or are at maximum capacity. He advised the project team to look carefully at the Sprint network and to explore a Bulgaria-only system that might expand to direct Internet access in the future.

2.1 Sofia Computer Market

Computer hardware and software are readily available in Sofia based on the number of advertisements listed in a weekly computer magazine. The price for a 486 computer with monitor and keyboard is US$1,230. Typical software prices include Lotus SmartSuite for US$350 and Microsoft Office Standard 4.2 at US$350.

2.2 CITnet E-Mail System

This company provides electronic mail service to MTK Konsult. In discussions with the project team, Mr. Markovski indicated he was very interested in building and maintaining a communications network for local governments in Bulgaria.

The software product used to access CITnet is FrontDoor (version 2.11), for use on IBM-compatible PCs using MS-DOS. It can be installed on any 286 PC computer connected to a modem. Access to the central node in Sofia is mainly through dial-up using the local public telephone system. (While this is certainly the least expensive means of connection, the telephone system is overloaded and prone to breakdown.) Anticipating the problems with the Bulgarian telephone system, even in Sofia, FrontDoor allows users to define on what day and at what time messages and file packets are to be sent. If transmission breaks down due to line noise or other errors, data transfer resumes where it was aborted after the connection is re-established. To ensure a more effective telephone line connection to the central node, CITnet offers the option of a dedicated line.

The software used at MTK Konsult is set up to work with both the Latin and Cyrillic alphabets. Using a program called Flex Type and phonetic Cyrillic fonts, staff are able to

write in both English and Bulgarian using Microsoft Word 6.0. With this software, it is possible to transfer Bulgarian-language files if both parties have the software.

Cost Factors (Purchase Price in Bulgaria):

FrontDoor software	US$250
Motorola FasTalk II Modem 14400bps internal/external	US$192-212
Dedicated line	US$100 per month

2.3 Sprint

The project team met with Ms. Asja Gourbalova, a sales representative for Sprint Business Telecommunications Company, Ltd. (SBTC). This company is a joint venture between Sprint International in the U.S. and Bulgarian Telecommunications Company, Ltd. Together they provide computer data communications services such as e-mail using PC based MS-DOS systems. Communications using both the Latin and Cyrillic alphabets are possible. SBTC relies on a regional network in Bulgaria of primary and secondary nodes in the cities of Sofia, Plovdiv, Varna, Veliko Tarnovo, Russe, Stara Zagora and Vratza.

Basic e-mail service is available via Sprint.net under the service known as ICASMail Message Handling System. This uses a host, or mailbox, at Sprint to send and receive e-mail.

Cost Factors

Mailbox installation	1,250 leva
Monthly charge for mailbox	560 leva
Usage access charge per minute	1.25 leva
Message sending charge per 1000 char.	2.5 leva
Message sending via Internet/USA per 1,000 char.	45 leva

Local governments in Bulgaria could establish their own host computer connection to the Sprint network. Available options include Data Call Plus (DCP) and Global Data Connection (GDC). DCP is a local dial-up system using the public telephone system. Usage is based at a fixed hourly rate, regardless of the amount of traffic transmitted. Localities would incur the cost of a telephone call to the nearest regional node. Additional costs include providing a modem and use of Sprint proprietary software—Route 400.

Cost Factors

Modem of international standard	US$200
Hourly rate for data transmission	300 leva
Sprint Route 400 software	US$250 (estimate)

For services using dedicated lines the GDC option is available. Under this option, Sprint charges monthly fees for the dedicated line but then only charges customers based on data transmission use. Monthly charges cover the cost of a port and modem. Installation of the dedicated line takes up to four months.

Cost Factors

Installation of dedicated line <100 km in length	17,000 leva
Monthly fees	17,500 leva
Kilosegment local transmission (64,000 characters)	45 leva

Sprint also can customize data networks. They can create application-oriented X.25 networks such as All-to-One centralized networking or All-to-All meshed networks.

2.4 Bul-Pak

The project team met in Plovdiv with an engineer working for Bulgarian Post/Telecom. The appointment with Mr. Luben Tsarev was arranged by Mayor Kapitanova. Mr. Tsarev manages the Bul-Pak operations in Plovdiv, as well as a bulletin board system (BBS).

Bul-Pak is the national system of data transmission (Public Sector Data Network—PSDN). Clients include the national government, banks, businesses and individuals. Bul-Pak is wholly owned by Bulgaria Telecom and is in direct competition with the network being offered under a joint venture with Sprint. According to Mr. Tsarev, the two networks use different lines and exchanges but are of similar quality. Bul-Pak can carry 256 simultaneous transmissions on its network. As with the other systems being offered in Bulgaria, clients can access Bul-Pak via dial-up or dedicated lines. Bul-Pak does not provide software or modems.

Cost Factors:

Dial-up:	
Cost of the call using local commuter line	variable
monthly charge	150 leva
line usage charge	150 leva
Cost using dedicated line:	
installation charge	5,400 leva
monthly charge	4,750 leva

Mr. Tsarev suggested that the local governments petition the central headquarters of Bulgarian Telecom to immediately issue access passwords to cities on the grounds of significant national priority.

3 CURRENT TELECOMMUNICATIONS USE

3.1 City of Smolyan

The project team met in Smolyan (population 36,000) with Mayor Dimiter Michailov, municipal computer manager Nencho Petrov, and Rhodope Municipal Association executive manager George Popov. The mayor expressed his frustration with the quality of sending data to other colleagues in the region. The telephone lines through the Smolyan and Plovdiv regional exchanges generally work well. Citizens in Smolyan can dial directly to Plovdiv, Sofia and internationally without needing operator assistance. In the mayor's office there is a direct line to the national government ministry headquarters. In contrast, use of the fax machine for data transmissions is difficult. In the mayor's experience, incoming fax messages are better than outgoing messages. In addition, it can take as long as two hours to secure an open line to Sofia for sending a fax during regular business hours.

At city hall, there are presently four computers—three 386s with 200 MB hard disks and one 486; none are networked and none have a modem. Much of the computer usage is for financial management. The city and Balkan Bank have negotiated a deal to provide four more computers to the municipal staff. The Balkan Bank representative, Mr. Stoyan Boukikov, explained the details. The bank will open an office in city hall and install a computer that is tied to the bank's local area network. The city will be able to upload its financial database onto that computer and share it with the bank. Both the bank and the mayor would like to network the new computers with those presently owned by the city. This would allow the mayor, finance director and department heads to share files. The bank is prepared to carry out the wiring procedures to establish the network. Unfortunately, neither the city nor the bank has the necessary funds to purchase a server (approximately US$3,000) or the necessary software (approximately US$100 per computer).

In Smolyan the project team also met with Mr. Christo Bukov, Deputy Director of Development and Marketing at the Post and Telecom office. He advised the team about progress toward installing a digital overlay network which will upgrade the present analog regional switching system.

3.2 City of Zlatograd

In Zlatograd (population 17,000) the project team met with Mayor Ginka Kapitanova and City Secretary Ivan Filipov. As in Smolyan, direct telephone lines are available for local and long distance calls. In addition, the city has a special emergency response "hotline" linking city hall with the major mining operations in the area. In her experience, the mayor is able to contact parties in Sofia with relative ease even during peak business hours. As one of the more aggressive mayors participating in the Rhodope association, Mayor Kapitanova is constantly using the fax machine to transmit long documents between municipalities. Mainly these documents are samples of local laws adopted by municipal councils on a variety of issues including privatization. Presently, without the ability to use e-mail, the mayor must

send documents via standard postal routes or use the fax. Neither is adequate because the postal service takes many days and the fax is slow and expensive.

At this time, the city hall has two computers and one fax machine. The computers are not linked nor do they have modems. The computers are used for a variety of tasks including word processing and budgeting.

3.3 City of Blagoevgrad

The mission in Blagoevgrad was twofold: meetings with municipal staff and with computer specialists at American University in Bulgaria (AUBG). City Council Secretary Ilian Popov was the primary contact point in the municipal government. At AUBG, the project team spoke with Ms. Sashka Tchameva, Administrative Computing Coordinator.

The local government in Blagoevgrad is one of the most advanced in terms of office automation technology and applications of computer network services. Initial assessments indicate that the city has taken full advantage of the services and assistance offered by AUBG, by the Peace Corps-operated business development center, and by USAID under a demonstration project in geographic information systems (GIS). For example, the city has a local area network (LAN) within city hall. Further, the city is linked to the large network of computers at AUBG. The municipal budget, payroll and inventory of rents on municipal properties are computerized. Finally, the city has access to a database known as "Norma" which lists legal documents promulgated by the national government and indicates which laws remain in force and those that have been repealed. Mr. Popov stated that if his city had e-mail capacity, he would use it to share information on economic development, especially privatization of municipal enterprises.

The computer network and Internet link at the university are probably the most sophisticated and extensive operations in Bulgaria. The 600 students and 200 faculty have access to almost 300 computer work stations connected to the Internet via a dedicated land line to Vienna, Austria. Computers at AUBG can access the World Wide Web, Mosaic and a variety of other operating commands. In addition, AUBG has a full-time staff of seven trained professionals to operate and maintain the network seven days a week, 24 hours a day. Project staff used the AUBG system to successfully send e-mail messages to colleagues at Massachusetts Institute of Technology (MIT).

While the network at AUBG is the most impressive, it also is the most expensive and is presently operating at full capacity. The dedicated link to Vienna costs US$6,000 per month. The transmission rate of data is very slow (9.6kps as compared to 56kps running at any major American university in the US).

3.4 U.S. Peace Corps

The administrative staff and volunteers at Peace Corps have an established e-mail network using a Bulgarian company in Varna, Digital Systems, as the service provider. The project team spoke with both the country director, Mr. Larry Bartlett, and Ms. Alice Bunker, a volunteer business advisor on assignment in Blagoevgrad.

The Peace Corps network uses the local dial-up telephone lines. Users must dial to the central node in Varna or use a local access number in Sofia. In the experience of Mr. Bartlett and Ms. Bunker, the exchange of data over the network is completed successfully. Both individuals indicated that the telephone lines are often at maximum capacity and it takes hours to access the node. Nonetheless, users are able to send and receive mail and retrieve files. Mr. Bartlett indicated that presently there are no plans to change service providers or upgrade the network to include dedicated lines.

The Peace Corps headquarters in Sofia handles the administrative aspects of the network service on behalf of the volunteers. Monthly fees and message volume charges are paid under a single account, and Peace Corps bought all the modems. Digital Systems provided the software. Mr. Bartlett was not able to provide information on cost factors during the brief meeting. However, the project team was able to secure cost information about EUnet, the company providing network connection to Peace Corps. This information is included in Attachment B.

4 OBSTACLES TO CONSIDER

Problems of both a technical and non-technical nature do exist. Some of the more complex challenges that need to be addressed include:

1. Will local service providers offer the kind of support necessary to sustain an active local government network?

2. In small and medium size cities with only a few computers, will access to e-mail and BBSs be available to a cross section of local officials and employees?

3. Will using the inexpensive dial-up telephone lines during off-peak hours provide the same level of reliability as expensive dedicated telephone lines?

5 OPTIONS TO CONSIDER

Computer-based data transmission networks are operating in Bulgaria at this time. Based on the foregoing research, a variety of options exist if USAID deems it appropriate to support a project to link local governments using data transmission systems. Computer hardware and

software are in sufficient supply and the telephone system is sufficient to support electronic communications.

Limiting a data transmission system to fax-only would not advance the productivity level or the networking capacity of the local governments to any significant degree. fax-based systems would in fact be less efficient. Computer-based data transmission (such as e-mail) can be sent at a much faster rate of speed to its destination and can be programmed to operate when telephone lines are less busy. Further, if transmission is interrupted, computer-based systems can re-engage transmission at the point when communication is reestablished. E-mail systems require more training of personnel to operate efficiently. However, in every city visited by the project team, there were computer specialists whose knowledge and experience are sufficient to address the inevitable maintenance issues that accompany any computer network.

In order to build a data network for local governments in Bulgaria, decisions will have to be made about the extent of direct USAID involvement in the construction and maintenance of the network, expected financial commitment by the local government clients and levels of service available on the network. Below are a list of possible options that relate to establishing such a network.

1. **USAID Direct Management**—A communications system needs both a network and a host to manage the network. USAID could be its own host, either at the mission in Sofia or operating at MTK Konsult. USAID would select the network provider, monitor and maintain the network links, handle administrative cost issues, and be the primary source of data files for use by the local government clients. This is similar to the way Peace Corps runs its network. Peace Corps headquarters in Sofia, for example, handles all billing for e-mail used by volunteers.

2. **Bul-Pak**—Using the PSDN operated by the Post and Telecom bureaucracy in Bulgaria is the simplest and possibly the least expensive option for a country-wide network backbone. Where this option becomes less desirable is in the management of the network. Clearly Bul-Pak has the necessary infrastructure network to rival that of Sprint. Both operations have several regional communications nodes and offer dial-up and dedicated lines as means of access. Nonetheless, there are very few private clients using Bul-Pak, there is no evidence to suggest a marketing campaign of any kind to promote use and system operators are not motivated by any need for measurable commercial success or customer satisfaction to ensure the sustainability of this network.

3. **Sprint**—This option offers a company with worldwide resources and the entrepreneurial drive to serve its clients. Sprint claims it can customize its package of goods and services to suit almost any need. The price for using this option is higher than any other choice. In addition, practical experience working with Sprint, as described by sources such as Mike Hoffman, indicates that the support services offered by Sprint Bulgaria do not keep up with the marketing hype. The ability of Sprint to provide global access using World Wide

Web and other services is an advantage. Nonetheless, for local officials in Bulgaria, the initial focus ought to be on expanding communications within the country and among themselves.

4. **Local Operator**—The main advantages of using a local operator to manage the network are sustainability and negotiated costs. It is in the best interest of USAID to ensure that a local government communications network remains in place after U.S. donor support concludes. Local entrepreneurs are the key to sustainability. Local operations offer greater flexibility in terms the computer hardware and software needed to be part of the network. Companies like Digital Systems (Varna) and Communications & Information Technologies (Sofia) are less likely to insist on clients only using proprietary software, as is the case with Sprint.

   It is reasonable to assume that for the Bulgarian entrepreneurs such as Kalchev (Digital Systems) and Markovski (Communications & Information Technologies), demand for their services is rising faster than their ability to meet that demand. This is where the issue of negotiated costs comes into play. Kalchev and Markovski are building businesses. They are motivated by market realities and need to deliver a quality product. Markovski, for example, is prepared to incorporate local governments into his client roster and expand the capacity of his network to meet this new service demand. His price will reflect the costs of buying more equipment which he can then dedicate to meeting the exclusive needs of the new local government clients. Markovski appears to be willing to build a dedicated network for local governments within his present network of commercial clients.

5. **AUBG Operator**—It is tempting to participate in the network established at American University in Bulgaria. As noted above, AUBG has a very sophisticated and well managed operation. However, their network is presently running at full capacity. The strength of the university is the wealth of technical expertise available. Future work on this project ought be carried out in consultation with AUBG in order to learn from them.

6. **Combination of Resources**—If one were building a municipal government data network in the U.S., computer hardware, software and direct service providers would be paired and matched to meet the needs of the target audience. The same style and strategy ought to be applied to constructing data networks in Bulgaria. There are at least four possible vendors (Kalchev, Markovski, Sprint and Bul-Pak) who have the ability to support e-mail for local governments. Second, there are two land-line-based network providers (Bul-Pak and Sprint). Each combination of vendors can be explored to quantify likely service levels, quality standards and price schedules.

ATTACHMENT A

Software Options

ATTACHMENT B

Company Profile, EUnet